



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

UNITY OF WORLD-CONCEPTION.

THOSE to whom philosophy makes no appeal, to whom metaphysic is anathema, and mysticism a mirage, turn hopefully to science as a guide to sensuous phenomena; and, in so far as the method of science is followed, no better aid can be found to explore the wonders of the world. Science, treading on the firm ground of experience and experiment, can travel far into the realm of nature, opening up at times new avenues of approach which even science hesitates to enter, and pursuing patiently her path towards some half-acknowledged and ever-receding goal of knowledge which the "man in the street" calls the "riddle of the universe." To speak of the arcana of nature as a riddle to be solved is, no doubt, to the humble student who brings his offerings to the temple of Isis, little short of blasphemous; but it is characteristic of the times to regard nothing as sacred and insoluble.

Now, the mariner who sails the high seas knows full well that to reach a known port in a distant land true orientation and correct charts are necessary adjuncts to his skill in navigation. Without these he could not attain his goal except at hazard and by hard adventure, and of these orientation is the chief essential. If he be navigating a sailing vessel across the trackless ocean, the general direction of his voyage will be towards his port of call; but many and devious may be the tacks against foul winds, away from the true direction of his objective, ere he sights his landfall. If finally, by consulting his chart, he decide that his goal may be reached by following

a definite course for a certain period of time, and he finds this indeed to be *true*, then it follows that all his previous positions pricked on the chart must have been correctly determined; and these positions are then made good. Science advances in this way.

This simple illustration, however, is applicable only to known ports and known routes; it cannot apply to the unknown. It follows on this analogy that any attempt to seek the unknown through the known processes and principles of the logic of science is a hazardous and speculative undertaking, since argument easily may be carried beyond the legitimate field of *verae causae*. Nevertheless, this is what many adventurers, trusting to a higher instinct, which sometimes inspires and sometimes misleads men, are trying to do at the present day. They follow confidently in the beaten path of science, in the hope that, eventually, they may outstrip her and win to the promised land. What that land shall contain for them is merely adumbrated by philosophers and men of science alike: if it were known, there would be no need to seek it except as a recapitulation of experience; being unknown, they await the dawn of another day, and yet another day, when, perhaps, this object of knowledge—dimly perceived—shall be fully determined.

But why, one may ask, should one postulate any such object of knowledge?

Should not we be content with things as we know—or think we know—them to be, rather than speculate on things as we would have them to be, since the former is the criterion of science? Is there any appeal to supersensuous phenomena? “The first and greatest question which philosophy has to resolve, in its attempt to make out a Kosmos,” said Sir John Herschel in one of his *Popular Lectures* (p. 474), “is whether we can derive any light from our internal consciousness of thought, reason, power,

will, motive, design—or not: whether, that is to say, nature is or is not *more interpretable* by supposing these things (be they what they may) to have had, or to have, to do with its arrangements. Constituted as the human mind is, if nature be *not* interpretable through these conceptions, it is not interpretable at all.” We know that migrant birds and certain aboriginal savages possess an innate power of orientation, and we account for this in a simple and natural way: by heredity, or adaptation to environment. We know, too, that man always has possessed in a greater or lesser degree an innate faculty of apprehension, which orients his mind towards something beyond himself in the direction of psychic experience and development. The world may satisfy his material needs—and does for most men, who find it a hard taskmaster—but in the realm of mind material needs are merely supporters of the intellect, as oxygen is a supporter of combustion. The trained mind—the intellect—ranges far beyond the common objects of thought and is nourished by ideas and ideals. There is, in short, in every healthy and simple mind, an innate sense of psychic function residual in consciousness, which men—certain idealists, at least—call the soul. To find a fitting habitation for the soul in the universe of mind and matter is the ideal quest of truth.

The restless spirit of modern thought, which courts disaster by the very excess of its energy, is held in check—no less than inspired—by the advance of science in search for a universal formula that shall interpret the significance of life and mind and correlate the forces of nature. Logically, such a formula is readily reached by appeal to the law of continuity, based perhaps on reciprocity of force—a logical extension of thought in a cosmos of recurring phenomena. But science is impatient of metaphysical speculation and builds its hypotheses on surer ground. It cannot altogether discard the metaphysic of

experience—as witnessed in the Newtonian laws of motion with their metaphysical groundwork—but it limits this indiscretion to the debatable borderland of mathematical proof. The groundwork of science is a closed system of thought; and, therefore, science never can usurp the primacy of thought, which transcends experience.

It is well for the advancement of science that this closed system of thought should be rigidly fenced and jealously guarded by constituted authority, lest speculation—as to what may lie beyond—lead to error and confusion. It is well, too, for the advancement of man that this closed system should not imprison thought within the iron bars of scientific materialism (epiphenomenalism) lest visions of freedom—for his insurgent soul—do but mock his highest aspirations, and so enslave his will to the exclusive exercise of his material functions.

In the realm of mind there are no barriers to freedom of thought; the attributes of mind are consentaneous with the established order of things. But no two men of deep and original thought see things precisely in the same order and as having the same value of mind; each will have his special connotation and his individual interpretation. Hence arise controversy and mutual misunderstanding. The great reconciliation between thought and things is, by common consent, adjourned to the Greek Kalends.

Nevertheless, the obvious unity of nature demands an interpretation of the cosmos in terms of finite mind, the exclusive heritage of man. A true system of thought should represent synthetic unity of world-conception and a monistic view of substance in correlated terms of mind.

Man is born to a godly heritage, the fruit of labor. Alone, among all forms of life on the earth, he enjoys this distinction, this dignity, this power: to labor towards some desired end, *consciously* and of set purpose; to create ideals of perfection and strive to attain these ever elusive goals.

He raises his home on the ashes of the past, which the wind scatters. He receives throughout his life more than he ever can repay, and thereby enjoys a balance of benefit. Time passes, and he too falls from the ranks of men marching towards their destiny; but, in passing, the spirit of man is handed on and recast from generation to generation.

Change and decay follow in natural order; each change serves its purpose for a time and is cast aside like a useless garment. Each generation stands midway between the past and the future; each regulates the periodic equilibrium of progress in the subcontrary movement of thought. Nature has a way of equalizing matters, a veritable force in organic evolution. That which never changes, but becomes only more conscious of itself, is the spirit of man, which inspires all his actions. Hence arise awareness and knowledge of self.

The torch of knowledge is passed from hand to hand, and burns brightly or dimly in the handling of it; at times it is all but extinguished. To dwell in darkness is to live a stunted life devoid of color and beauty; to rekindle the torch is beyond the power of ignorance. The torch of knowledge is a sacred flame, and those who serve nobly in its temple enjoy a distinction beyond the recognition of princes; posterity acclaims them. Knowledge nourishes and advances thought. Like the sun, it sets all things in motion; it illumines all objects of perception; it brings forth fruit in good season.

Thought is the fruit of the mind. Beautiful thoughts live for ever and purge the mind of evil communings. Law and order are evolved from careful culture of the highest thought.

Out of the chaos of unrelated things (such as cows and cowslips), of ignorance, of blank mind, there arise here and there threads or filaments of knowledge which, on being carefully traced, are found to link up facts that bear

a family likeness to one another—facts which thereby are said to be correlated, the sum and synthesis of which is true knowledge. The nervous system of man, apart from his body, thus may be pictured. The animal, vegetable and mineral kingdoms are examples of this arrangement of ideas. The solid, liquid and gaseous character of substances are other useful generalizations for grouping together co-ordinated factors of knowledge.

Our outlook on the world, too, is greatly simplified and extended by regarding its main natural divisions apart and in their inter-relationship—the land, the sea, the air. These also may be called kingdoms.

There are kingdoms, then, of the earth and of mind. Once the order of a series of allied facts is perceived, it becomes possible to establish a law by which these can be explained and related to other groups of facts. By this means we recognize families of facts, or categories of thought, which can be isolated, or set apart, for the purpose of closer study; to confuse these, by mixing them together, is to lose all trace of logical consistency.

The highest minds of all time have been engaged in this fascinating pursuit. First warily, by means of hypotheses or assumptions—mere guesses, sometimes—to account for what is not clearly understood, these men of thought and leading have created out of the chaos of things, dimly perceived, a structure (or framework) of logical reasoning (or simple formulas) which links up and groups all like facts and principles; but, until the idea or spirit which explains or vitalizes the meaning and purpose of this structure is discovered, it remains a dead thing: it cannot live in the race-memory. Monuments of patient research such as these are not often built up; but, when successfully raised, they remain—for centuries, perhaps—landmarks in the maze of thought.

Now the ideas that explain and vitalize many things that happen on the land, in the sea, and in the air, can be indicated briefly by two pass-words which carry us very far into debatable kingdoms of thought. These are the idea of *evolution* and the idea of *circulation*.

The idea of evolution is mainly associated with development of structure, or form: the external aspect of anything. The idea of circulation is associated with the function of elements composing anything: the internal flux of things undergoing a change of state, which usually is in the direction of complexity and expansion; as a butterfly from a grub, a torrent from a cloudburst, a revolution from an ideal. In this natural sequence—seed, flower, fruit—we perceive a *continuity of idea* in the same plane of thought, by which we come to recognize general principles of growth and development. If natural phenomena—things that happen in the orderly course of nature—were not uniform and constant, we could not reason logically, and therefore would be unable to discover any laws; but we rely absolutely, and stake our lives daily, on the uniformity and constancy of natural phenomena, and so escape shipwreck at sea and many perils by land in our familiar intercourse with nature.

There is, on the whole, a progressive evolution of forms from simple to complex, from indefinite to definite, both in things that live and things that are inanimate; and generally it will be found that the change of state, or degree of modification, is from a lower to a higher form of structure and function—and by higher form we mean a state better adapted for survival or service in the purposes, or apparent ends, of nature. From this broad generalization we derive the useful aspects of our subject which are known as the *organic* and the *inorganic* realms of organization, in the building up of the world: things which live and pass on *life*, and things which change or modify their

material composition. Thus, the fundamental antithesis in nature is *mobility or motion* (life and movement) and *rigidity or inertia* (complexus of matter); and the interplay between these dual forces in nature enables us to formulate a physical basis for phenomena.

Nature knows no rest. There is a constant flux and whirl of particles in all movements of matter, an interchange of properties between the elements of substance. But with this molecular motion we need not concern ourselves, beyond noting the fact that—for science—it exists; it is enough for us to have grasped a working principle, universally applicable, which underlies the study of terrestrial phenomena and illustrates the countless phases of circulation.

Restless nature moves on the face of the waters, which leap towards the moon in its path and sway towards the sun, by which tides are caused. Restless nature draws up bountiful supplies of vapor, which condense in a cool atmosphere and flood the earth with life-giving properties; denude mountains and scour out valleys; loose everything like hounds from the leash, to run an appointed course. Gravity, density, temperature and pressure are the principal agencies through which the activities of nature are revealed to us—apart from growth and development: in the roar of the storm and in the sweet silence of the desert, in the circulation of air and ocean currents, in the transformation of all matter on the surface of the earth and in the mutation of living forms, passing through the familiar cycle of change and decay, life and death, movement and counter-movement.

This constant struggle to establish equilibrium between the interacting forces of nature is thus curiously shown to be paradoxical in the sense that equilibrium does exist everywhere and in everything; but with this qualification: it exists only for a moment of time in a potential state of

change. Like the see-saw of children, nature, poised on the fulcrum of motion—i. e., stability of motion—determines the sway, this way and that, of the counterpoised levers that constitute our children's plank. The fleeting moment of equilibrium—i. e., moment of momentum—is always on the point of being overcome by the forces of action and reaction; and in these fleeting moments we pass our individual lives. Time, then, in all spatial relations, is inseparably associated with the consentaneous action of symmetrical parts in any system: the longer the time, the greater the change in the evolutionary field.

Action, however, is of two kinds—determinate and indeterminate. An indefinite act is simply the continuity of some previous movement in the same direction, subject to some unforeseen check to its development or issue in the flux of things. A free act, on the other hand, may be defined as a movement, or the arrested development of a movement, directed towards or against some definite end or purpose. Nature—as we understand her—being intensely dualistic and teleological, thus offers a choice between order and chaos, chance and purpose, in our construction of a cosmos; and therein lie all the elements of confusion and controversy.

What we see in nature is what we, ourselves, posit. The so-called laws of nature are, in reality, the laws of man-made nature—of man's interpretation of natural phenomena: causes, sequences, and the like. Without some idea of these, we cannot truly grasp the inner meaning or structure of things, even of the simplest. Most of us, it is true, are content to take things as we find them, with the official label attached, and secrete them in our memory; but there are others, of a rebellious type of mind, in whom a divine discontent reigns—a rage for finding out *how* things are made and *why* they work, a reverence for nature, worship of beauty. To all such, nature appeals with irre-

sistible force. The world becomes a temple—the temple of Isis—not a dead museum, in which silence and contemplation, search and research, thought and study, are the proper attitudes of mind. To all such, life never can be devoid of interest, never can disappoint, *but never can satisfy*, because the pursuit of knowledge for itself lures them towards an ever-receding horizon beyond which truth dwells, forever beckoning.

* * *

The truth of everything that is true and the falsity of everything that is false are true and false, respectively, only in relation to prevalent criteria of knowledge. The movement and persistence of thought are as fluent as the flux of things. But although the critical value attached to the precise meaning of a given term may vary in time, the idea created in the mind by its spontaneous expression—i. e., mental presentation—has a tendency to persist. Thought, then, in its persistence, has the quality of momentum; and if in quantitative analysis a fixed ratio to the sum of things—a world-formula—be sought, it may be found to lie in certain general principles the root idea of which is self-evident and of universal application. Of such are the idea of gravitation and the idea of biogenesis (life from life). The precise terms in which at the present day these two problems of science may be stated are undergoing revision; but, whatever be the issue in detail, their qualitative significance as fundamental concepts of mind is not likely to be affected.

The ideal goal of knowledge can scarcely be reached, or even sighted, until physical science (cosmology) becomes more philosophical and catholic in its outlook on the objects of knowledge; and until philosophy, thus reinforced, adopts the method of science in examining the intimate nature of knowledge, in order to derive a uni-

versal (space) and fundamental (time) principle that may be expressed in the unity of a formula, or constant of function, in cosmogonic evolution. Some such controlling factor seems essential to a strictly monistic view of substance and in order to define the evolutionary process. This factor we take to represent, in principle, the coefficient of meaning, carried through all the operations of thought in their quantitative expression. Unity of idea must underlie and govern any rational system of organization; and this unity, in some form, must be capable of realization. For, if a thousand persons of diverse minds surrounded a perfectly conical hill, all might reach the summit, blindfold, by taking the line of greatest resistance. This guiding principle in nature we take to be *difference of potential*, in the macrocosm: *identity-in-difference*, in the microcosm.

Is such knowledge possible? All we can attempt, in this place, is to indicate a few directions in which this root principle may be traced.

Our philosophy of unity postulates universal law operating harmoniously and reciprocally in nature, based on the dynamics of force—as a mechanical conception—which is the motive-power of the cosmos.¹ The fundamental idea of force has not yet been fully stated by physicists. Force (they say), like energy, is a dual conception, involving not only that which generates, accelerates, or changes motion; but it involves also resistance. No force exists without resistance. Ultimately, all things resolve themselves into two incomprehensible factors, and their duality is reconciled by a mysterious underlying unity which transcends our conception—or, at least, experience—both in living and non-living matter: the persistence of energy and the

¹In general terms, force (or, at least, virtual force) may be defined as the ratio (MV^2) of mass and velocity in time and the constant of motion in space. In all apparent interactions between force and substance, the product (or sum) of the potential (or existing) energies remains unchanged. We therefore regard force and substance as two aspects of one and the same principle: conservation of work.

resistance of inert matter are essential to the existence of things, in the promulgation of science. Matter (in our view) is the vehicle of energy—its objective reality; and both are attributes of force, by virtue of which things are as they are—a self-compensating unity. Eliminate stability of motion, which binds atoms and molecules together in temporary groupings, *pari passu*, and the world would be pulverized into integral particles, each of which would be an electrostatic nucleus of energy. Destroy, other than to convert into energy, an appreciable aggregation of matter, and the cosmos would collapse—that is, the cosmos of science.² The mere fact of stability denotes static equilibrium, any subsequent disintegrations or mutations being in respect of time only. The conservation of energy and of matter are fundamentally essential to unity of world-conception. In how far may that unity be further expressed?

The lithosphere, or crust of rocks, and the hydrosphere, or system of oceanic waters, compose the planet earth, which in its orbit round the sun carries an atmosphere in its flight through space. The ether of space, which the unification of physics compels us to postulate, is the medium that transmits light and heat throughout the universe, and probably also is the seat of all electrical and kinetic forces. It even may be conceived as the immediate origin (or substratum) of all life and movement on the earth. The thousand million stars and planets which we calculate to be in constant orbital motion float in this ethersphere, as jelly-fish in the ocean, and are composed of its primordial

² Thus, according to Newtonian principles: if the earth were to be blown into ten thousand fragments *at this instant*, every particle would return (or persist in a tendency to return) at some time or another to the point in space (relative to the solar system) which we occupy *at this instant*. Similarly, if an object be ejected at any time, it will describe an orbit which must pass through (or persist in a tendency to pass through, unless acted upon by some external force) the point in space (relative to the solar system) from which the expulsion occurred. This we take to denote reciprocity of force (by which a dynamical theory of motion is demonstrable) in mechanical causality: in other words, the mechanism of gravity, by which conservation of momentum is maintained.

world-stuff—i. e., modifications of ether. Thus, it may be inferred, electronic or corpuscular substance, interpenetrating all modes of matter, is the common basis or constituent of matter, the *Urstoff* in the laboratory of nature. The visible universe of matter contained in it is scarcely appreciable, in comparison with its immeasurable immensity. Nevertheless, the principles underlying the subtlest processes of nature are symmetrical, both in the infinitesimal and in the illimitable, in the atom and in the sidereal system; and this may be assumed, failing evidence to the contrary, in a system of thought proceeding from the known to the unknown by logical inference.

A molecular theory of matter, if less demonstrable than a molecular theory of electricity, is foreshadowed in the researches of Thomson, Larmor, and Lorentz. "For the most natural view to take, as a provisional hypothesis," says Sir J. J. Thomson,³ "is that matter is just a collection of positive and negative units of electricity, and the forces which hold atoms and molecules together, the properties which differentiate one kind of matter from another, all have their origin in the electrical forces exerted by positive and negative units of electricity, grouped together in different ways in the atoms of the different elements." This amounts to an electro-magnetic theory of matter, of electrical forces between material particles. A system that admits of quantitative statement and analysis is essential to a working hypothesis. In a qualitative sense, too, if the energy of affinity, which individualizes substances, be the kinetic grouping of the elements of bodies, foci of force and centers or nuclei of condensation bear a dynamic relationship in some conceptual scale of classification, which may be called an isochrestic scale.

³ Presidential Address: British Association, 1909. His electrical methods of experimenting tend to confirm the view that every atom (like the ultimate organic cell of the biologist) consists of an inner core or nucleus of definite significance and an outer husk of indefinite organization.

Furthermore, in the same address, Sir J. J. Thomson made the following illuminating pronouncement. "If," he said, "we regard potential energy as the kinetic energy of portions of the ether attached to the system, then all energy is kinetic energy, due to the motions of matter or of portions of ether attached to the matter . . . and that the potential energy of the visible universe may in reality be the kinetic energy of an invisible one connected up with it. We naturally suppose that this invisible universe is the luminiferous ether, that portions of the ether in rapid motion are connected with the visible systems, and that their kinetic energy is the potential energy of the systems."

In other words, we presume, if the ethersphere be the dynamic plenum of substance and the substratum of matter, all motion is primarily ether-motion, and all mass is essentially ether-mass, fundamentally and phenomenally: indeed, it must be the *primum mobile* of the forces of nature. The specks of matter called worlds, immersed in the maelstrom of this mighty mobile force, in silent strife of motion, and correlated streams and drifts (witness, the stars) of motion, are as jelly-fish in the ocean of space, and can no more set up independent motions of translation in respect of cosmic environment than submerged bodies in terrestrial ocean-drifts. Thus: the apparent mechanism of the universe may be likened to a seething whirlpool of interrelated currents and eddies of gyroscopic motion (or moving masses of equilibria) in which collocations of substance and aggregations of matter, at every stage of combination and in every degree of cohesion, move and have their being. And all this takes place simply by energy of relative position (i. e., difference of potential) spontaneously working on inertia of mass, until equilibrium is established, *pari passu*, within the system (i. e., equilibrium of forces between pairs of opposite sign).

This monistic world-conception may be developed into

a dynamical theory of motion—a world of moving forces, and not a world *at rest*—by assuming stability of motion to connote the moment of momentum (or static equilibrium) of a system, and to correspond with reciprocity of force in mechanical philosophy. To the dynamic mind, motion that ceases to be mobile, in the routine of cosmic phenomena, becomes mass (the product of correlated motions); and energy that ceases to be active—i. e., kinetic—becomes potential energy, available power, or force. All mass movements, as well as intermolecular action and reaction, may be expressed in terms of energy, power, or force, each of which in its ultimate expression may be held to comprise a synthesis of syntheses of motion; and unity of world-conception may be readily reached by regarding motion as the circulation of energy-systems in the ether of space, arising from difference of potential (expressed in ratios of equilibria) and giving rise, as in electricity, to associated phenomena. Thus, it seems reasonable to infer, from these generalizations, the existence of an underlying principle—the prime integral of all evolutionary processes—which, if not force, or the persistence of force, at least involves the conservation of energy. We throw out this crude suggestion as an embryo formula: That the negative instability of any system whatsoever is controlled by a positive stability of type, or *persistence of ideal configurations*, in cosmical evolution; and that all modes of matter in organic affinity are determined by typical groupings of positive and negative units of “electricity,” or aggregates of particles, in specific association with homogeneous elements and heterogeneous compounds, or aggregations of mass, in the evolution of corpuscular substance. Density and mass are the watchwords of life and movement, and order of mass is the order of evolution. Thus, identity-in-difference in the microcosm may be held to connote difference of potential in the macrocosm.

Mr. F. Soddy, discussing the evolution of the elements, says: "The energy changes accompanying any form of continuous material evolution must be the controlling factor of any cosmical scheme, and the failure to recognize this so deeply affects all the existing views on cosmical and terrestrial evolution that it is difficult to see what will remain when it is rectified."—(*British Association Report*, 1906.) The trouble with schoolmen is that they cannot, or will not, think in categories of thought other than those in which they have been trained. To them, the mere attempt were like writing with the left hand.⁴ Experimental science, not being able to simulate nature, necessarily has recourse to conventional methods of demonstration—methods, no doubt, that yield true results in quantitative analysis. Categories that are rigidly segregated in the lecture room are, however, intimately associated in natural processes, and these are the only real categories of genetic logic. In order to demonstrate the evolutionary movement—which of necessity must be continuous, whether we perceive the continuity or do not—the intellect must bridge the gap between the organic and inorganic realms of organization by postulating a constant of function in the universe of substance inseparably associated with a logical extension of principle in the realm of mind. Is such an aid to clear and consecutive thinking to be discovered in *verae causae*? Our thoughts, based on the significs of science and rigidly controlled by logical method, must range through the debating grounds of psychology, psychophysics, and metaphysics, to a new category of thought expressed in terms of energetics. We may then discover

⁴The Newtonian laws of motion, for instance, cannot be taken as representing absolute truth. In infinite space, and without a frame of reference, a body cannot be said to be at rest or in motion—far less, motion in a straight line. A frame of reference is essential. These laws are merely projections of our perceptual experience. If our perceptions were different—as, indeed, they are in the dynamic mind—the laws would be differently expressed. Identity-in-difference reconciles the duality.

a universal calculus, or constant of function, applicable to all forms or modes of motion. In fine, a high order of mind might derive a higher—i. e., more extended and complex—synthesis. “May we not say,” remarks George Henry Lewes, “that every special form of existence, organic or inorganic, is determined by the synthesis of its elements?” That being so a synthesis of syntheses of syntheses may be reached.

All thinking is relative. Our thoughts must have some background or framework, our mind some standard of value, before we can identify and classify any object of knowledge. To name a thing is not to create it, but to identify it; and this is the task of science. Consequently, nomenclature plays an intrinsic part in the discussion of phenomena. It is the *identity-in-difference* that characterizes objects of knowledge, rather than their abstract qualities apart from a frame of reference. Abstract and concrete ideas of things arise from introspective and extrospective analysis; and no mind can form a true synthesis of any apparent unity without complete knowledge of its constituent parts or elements. When such knowledge is incomplete, the synthesis that presumes to be called a law of nature is no more valid than any other hypothesis by which the pathway to reality may be profitably explored. Thus, all the so-called laws of nature simply represent for us a universal consensus of expert opinion, an economy of thought, a shorthand method of standardization to facilitate further inquiry. They are true, but only relatively to existing criteria and forms of knowledge. Nature knows no law, as apprehended by our anthropomorphic thought, but the law of being: *Whatever is, is*, which is the fundamental law of thought. We must take things *as given*, and try to understand them. We must think cosmically and humbly.

The advance of knowledge waits on the discovery of

mechanical media or experimental research to stimulate or augment our sense-perceptions; and mental presentations rest, in the meantime, on rational hypotheses that co-ordinate and interpret the empirical dogmas of science. Scientific faith and imagination are essential handmaids to discovery. Scientific instinct is the herald of exact knowledge. There is nothing new under the sun save in our perception of it, when it is added to the common pabulum. It is in the analogies, the correspondencies, and the homologies of nature—dangerous as these are as guides—that the man of science, by his laboratory experiments and tests, seeks for new light on old problems. Thus, the secret of electricity, which may determine our knowledge of the structure of matter and much else besides, is now being unraveled in the vacuum tube. The atom (revised version) is the philosopher's stone, which, peradventure, may carry us a little further than Plato and Aristotle.

The mere fact that coordination of phenomena and synthesis of noumena are sought in all departments of earth-lore in relation to the cosmos indicates the demand of reason for causality, since the laws of thought and the laws of motion are intimately associated in function. Unless nature⁵ thought (i. e., functioned) consecutively, logically, and inevitably, it would be impossible for the man of science to formulate any rational hypothesis. But since sense-impressions and secret cosmic processes may be incongruent, or even incompatible, allies, we fall back on real logic, as being the surest path to essential truth, intuitively apprehended as such. Logical inference (no less than mathematical formulas) is an economy of thought, the shorthand of mind—that is, the trained mind or intellect, which reflects, however dimly and inscrutably, the

⁵ Nature, regarded as cosmic process, is scarcely to be distinguished from the Absolute of philosophers, but is more anthropomorphic in form, and to that extent better fitted to express the whole of conceptual analysis, in cosmic function. The Absolute is revealed in the unity of nature.

mind and meaning of the cosmos. Sharper definition of focus resolves the nebulous haze that screens cosmic phenomena. If there be persistence and equivalence of mass, there must be also persistence and equivalence in the mechanical value of energy—*free* energy, determining all phenomena—in a quantitative sense, the change in consistency or valency yielding a qualitative process of evolution; and therefore it were illogical to limit evolution to ponderable substance. The visible universe is finite, simply tending to aggregation of mass; the invisible universe underlies all phenomena, of which it is the nervous system—so to speak.

Science performs a useful function in the standardization of thought, of sense-data; but it never can usurp the prerogative of mind to pronounce final judgments, nor does it advance such a claim. Science is method—a means, not an end. The most advanced thought of the day is, we may infer, endeavoring to bridge the abyss between the organic and the inorganic realms of organization—an abyss in our *knowledge* only, since evolution must deny itself if it admit discontinuity of its processes. By a secret process of integration, nature *informs* matter, and her purpose is thus satisfied, by specific molecular association of individualized substances. “The true cosmic line,” says R. B. Arnold,⁶ “in the matter of individuation, is—the electron, corpuscle, atom, molecule; then, perhaps, the physiological unit in the vital organism, and finally the mental being.” This line of attack is reinforced by Mendelian method, which is the idea of a living organism as built up of numerous unit-characters represented in the germ-cell by definite factors. Such a scheme were capable of quantitative, as well as qualitative, analysis; i. e., constant ratio of quantity, as well as constancy of association, in nature’s laboratory. Hence, in the phenomena of life

⁶ *Scientific Fact and Metaphysical Reality*, pp. 104-5.

and mind, ratios of disparities—if such can be measured—would determine, by difference of potentiality in related categories, the movement of thought—i. e., development of idea—in substance. The persistence of psychic life thus may be traced, from its genesis in self-consciousness—"I am"—to its penultimate issue, in the realm of mind. Whether thought can be carried further than organized inclusive experience—i. e., mind—is the "riddle of the universe," as we understand it. That depends on experience; and the world is still young. "Men should work, as if they were to live for ever; and live, as if they had to die to morrow." The work is everything, the man is nothing—to posterity.

Finally, our concepts of time and space in terms of formal thought may be delivered thus: Time and space may be defined as sense-intuition of that which is internal and external, respectively, to mind, while as a composite reality and essential unity these prime concepts, in our consciousness of being, are phenomenal (*qua* sense-intuition) in the inherent condition of any connotative or genetic relationship. In all interactions between time and space, the ratio of relativity remains unaltered. All depends upon the point of view, and until this fundamental principle in cosmic evolution is grasped and applied, professors of your Know-not-what school will vex their souls, and their students, in vain. Thus, ether may be continuous as regards matter and discontinuous as regards substance (in the degradation of energy) without losing its essential character of continuity in substance, any change of relative consistency, or valency, being due to difference of potential, as in the flow of electricity from one body to another. The ether must, in fact, be cleavable—though continuous in respect of "gross" matter—in the sense that water and air admit of differential movements of equilibria. Given an ether of the density claimed for it, we can conceptualize

a cosmos *congruous with known truths*. The ether of space, in which the warfare of worlds is waged with as little commotion to its mass as from the dropping of a pebble into the sea, which bears the stress of the universe of matter as easily as a radiogram from America to Europe, contains for us, it may be, the arcana of nature. It is the last unexplored region in the realm of mind which man may aspire to reach. It is a fruitful field for the philosopher of nature, in which the psychologist may find his *psyche* and the biologist his *life*.

We argue in this way. If, as a necessity (or even as a postulate) of reason, a missing article (or connecting link) *must be* located in one of twelve places, and we ransack eleven of these places without finding it, then *it must be* in the twelfth place, even, though that place be beyond our reach and therefore excluded from actual investigation. This conviction of mind produces faith in the understanding. We adopt the view of Mr. Balfour, that as natural science grows it leans more, not less, upon an idealistic interpretation of the universe." The conservation of thought-values is the sole objective of truth. The known and the unknown, the natural and the supernatural, are correlated terms. They complement one another, in the ratio that decrease of the one demands increase of the other: the momentum of truth. Intellectual life is a great conversation, having for one of its objects the elucidation of phenomena. Progress is like a swallow's flight—a dip and flow along the mean level of current thought.

If a complete synthesis or sequence of cosmic phenomena could be thrown on a screen by cinema-process, the various phases of evolution would blend into a perfect unity and function harmoniously; but, examined separately, each stage would be finite and imperfect. It is by intuitional perception of the principle of continuity in the logic of nature that we connect the invisible with the vis-

ible systems in the correlation of phenomena, both in the organic and inorganic realms of organization. Our fundamental assumption is, that the law and order which we perceive in nature necessarily imply and denote intelligent purpose; and life and mind define that purpose as the evolution of spiritual being, thereby indicating and postulating the persistence of psychic life beyond the present range of human intellection. By psychic selection, mind must dominate body in an ever-increasing degree, to which no limit can be set. If the purely utilitarian, determinist, and mechanical aspects of evolution be insisted upon, it is impossible to account (and we need not apologize) for the remarkable development of psychic function, which compels man to subordinate his material advancement to the dictates of his conscience and his sense of duty. Self-sacrifice and not self-preservation is characteristic of those whom we honor and love; and it is in the equitable or rational adjustment between egoism and altruism that we recognize the sanity and virility of the race. Race-instinct cannot be divorced from the persistent force which creates heroes out of men, martyrs out of saints, and seers out of thinkers. *Ideas rule the world.* What will people, ten thousand years hence, think of our philosophy? Surely, we must make provision for some intelligent development in the expansion of thought. It takes much weight of wisdom to plumb the depth of our ignorance—the greater the wisdom, the greater the depth—but shallow fools reach mud with surprising ease. The revolt of man against spiritual extinction is a tribute to his intelligence, which demands a *meaning* for life and mind, other than the reproduction of species.

ARTHUR SILVA WHITE.

LONDON, ENGLAND.